

## **Impact of Pesticides on the Environment: Perceptions, Knowledge and Use Practices of the Rice Farmers of Japan and Bangladesh**

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**Goal and Scope.** Pesticide use in crop production has been suspected of being a major contributor to environmental pollution. The post-war period has seen continued increases in both agricultural productivity and pesticide use. There are widespread and growing concerns of pesticide over-use, relating to a number of dimensions such as contamination of ground water, surface water, soils and food, and the consequent impacts on wildlife and human health. The use and abuse of pesticides has disturbed the ecological balance between pests and their predators in developed and developing countries. The lesser developed countries still don't use as much pesticide as does the industrialized world, however pesticide use in many third world countries is not as regulated as it is in the developed countries. The rate of pesticide use per hectare of land is highest in Japan (17.7-kg a.i./ha). In the developed regions, the pesticide market is dominated by herbicides, which tend to have lower acute, or immediate, toxicity than insecticides. In most developing nations, the situation is reversed, and insecticide use predominates, with a correspondingly higher level of acute risk. Although the volume of pesticides that developing countries use is small relative to that in developed countries, it is nonetheless substantial and is growing steadily. FAO estimated that in the 21st century, pesticides use would increase in the developing countries. Therefore, this paper presents a comparison of farmers' pesticide use and knowledge, and the perception of the impact of pesticides on the environment between a developed (Japan) and a developing (Bangladesh) country.

**Methods.** A questionnaire survey has been conducted to collect the data from the farmers. Data have been collected from 44 rice farmers in Japan and 86 farmers in Bangladesh. For Japanese farmers the questionnaires were distributed by hand and at least 1 to 2 weeks were allowed to complete the questionnaire. But in case of Bangladesh, a face to face interview was conducted to collect the data.

**Results and Conclusions.** Japanese farmers used insecticides, herbicides, and fungicides as well as mixed formulations with a high dose on an average of 10-30 kg for solids and 1 to 2 liters for liquids per hectare. Although most of the pesticide is more or less safe according to WHO classification but in consideration of profitability and cosmetic value they made at least 7 to 8 applications per season. The Japanese farmers had better knowledge, mixed attitude and stronger perceptions about the environmental impact of pesticide than did the Bangladeshi farmers. In both countries farmers perceived the pesticides as effective controls of target pests with no human health hazards.

Some of the farmers surveyed in Japan knew about the harmful effect of pesticides but still used high doses frequently to enhance the cosmetic appearance, and hence the profitability, of rice. On the other hand, the farmers of Bangladesh used mostly insecticides at lower doses (1 to 10 kg/ha) and reduced frequency (1 to 3 sprays per crops). But the fact is that most of the pesticide was extremely to highly hazardous to both environment and human health and, considering the cropping intensity, the environment and the Bangladeshi farmers were more highly exposed to pesticides. Among the insecticides used by the Bangladeshi farmers, Bashudin 10 G, Diazinon 60 EC, Sumithion 60 EC, and Padan 50 SP have already been banned for use on rice in other developing countries. In Bangladesh, laws and regulations governing the importation, formulation, repackaging, distribution, advertising, and use of pesticides are not strictly enforced. Therefore, obsolete pesticides like Bashudin are still being using by farmers and are available at a low price compared to others.

**Recommendations and Outlook.** Because of the use of high doses of pesticides, Japan is facing serious environmental and health problems. Along with industrial pollution, pesticide pollution is aggravating the situation and the natural ecosystem is being threatened. There is an urgent need to reduce pesticide use in Japan. In Bangladesh the laws and regulations governing pesticide use should be enforced strictly and farmers should be educated about the harmful impacts of pesticides. There is an urgent need to assess the impact of pesticides on human health and determine the level of pesticides in soil, water, and air in Bangladesh.